EASING THE FLEET MAINTENANCE BURDEN THROUGH THE RMA

NDIA SYSTEMS ENGINEERING CONFERENCE

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NETWORK CENTRIC MAINTENANCE
(Integrated Systems RMA)

- **ASE KNOWLEDGE BASE**

- **WEB ENABLED ACCESS PORTAL**

- **WEARABLE TELE-MAINTENANCE AID**

Aviation Support Equipment (ASE) Knowledge Based Website

- Objective: the Original Project Objective Has Evolved From Simply Exploring Network Centric Maintenance Opportunities to Yield a New Fleet Tool That Provides Automated Problem Submission, Assignment, Tracking and Potential Solutions

- Approach: The ASE Knowledge Base Web Site Will Provide a Direct Link Between the Fleet User and the System Specific Help They Need. This Will Be Achieved Through an Interactive Query Mechanism Using a Database and a Verity Search Engine
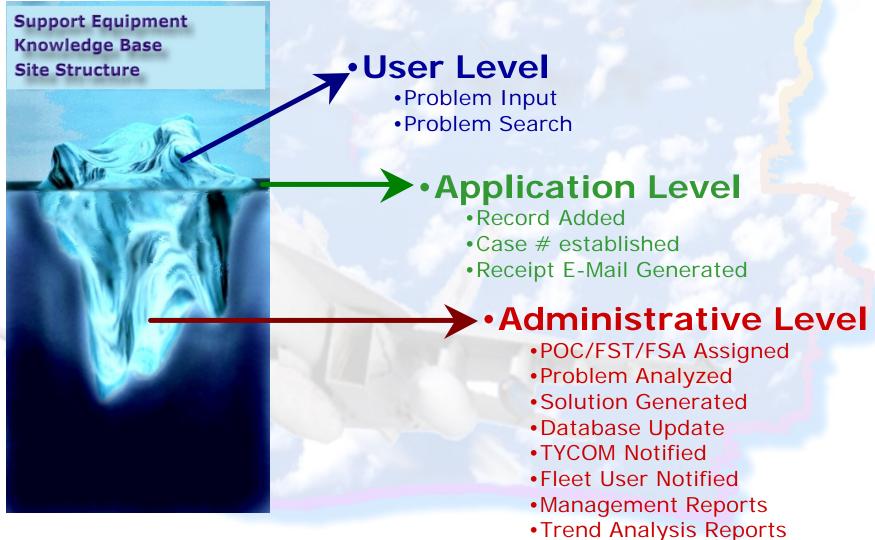
Benefits

- The ASE Knowledge Base Will Be Self-generating Capturing Corporate Knowledge As It Grows

- Management Tools Provide the POC/IPT/FST With Trend Analysis Capabilities and Justification for Problem Resolution

- Closes the Loop Between the Fleet Users and the Design Engineers Achieving Team Unity

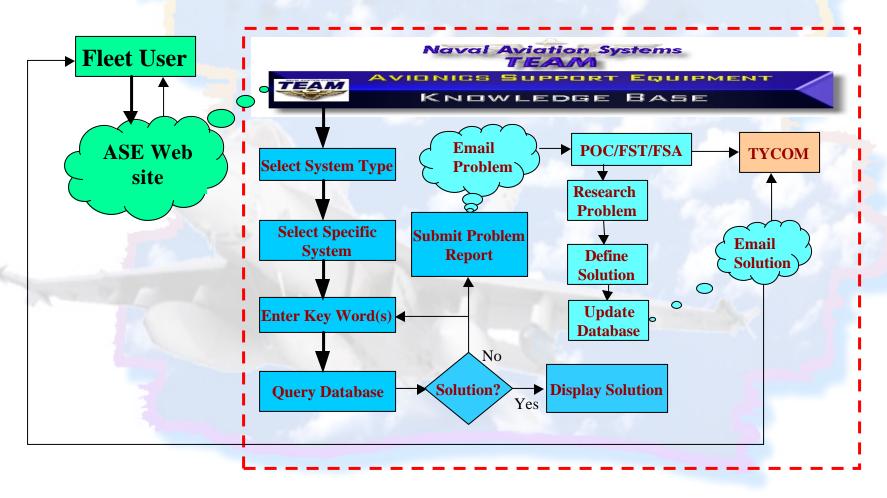- Faster Response Time for Critical Issues

ASE Knowledge Based Web Site Approach

**Support Equipment
Knowledge Base
Site Structure**

- **User Level**
  - Problem Input
  - Problem Search

- **Application Level**
  - Record Added
  - Case # established
  - Receipt E-Mail Generated

- **Administrative Level**
  - POC/FST/FSA Assigned
  - Problem Analyzed
  - Solution Generated
  - Database Update
  - TYCOM Notified
  - Fleet User Notified
  - Management Reports
  - Trend Analysis Reports

ASE Knowledge Based Web Site Approach

Information Flow

ASE Knowledge Based Web Site Approach

System Architecture

- Operating System(NMCI Compliant)
  - Microsoft Windows 2000 Advanced Server
- Relational Database (NMCI Compliant)
  - Microsoft SQL 7
- Programming Language(s) (NMCI Compliant)
  - Cold Fusion 4.5
  - HTML
  - JAVA
- User Interface (NMCI Compliant)
  - Browser
  - E-Mail Client

Design Status

- **Design Engineers**
  - Mr. Robert Carbrey, 486300E
  - Mr. Chris Mckinney, 486300E

- **Operating System**
  - Installed and Configured

- **Relational Database**
  - Installed and Linked
  - Table Definitions Complete

- **Programming**
  - User Level Code Complete
  - Application Level Code 90%complete
  - Administration Level Code 10% Complete

- **Knowledge Data**
  - Known Issues Entered for Limited Scope Demo

Beta Status

- The ASE Web Site Is Currently Available With Limited Demonstration Capability.

- Access the Site at the Following Web Address:

  http://209.239.242.117/ase/

Website Graphics

Discretionary Tasks

Phase I: Concept

Phase II: Design

Phase III: Beta Deployment

Sponsored Tasks

Phase IV: Management Tools

Phase V: Version 1.0 Deployment

Phase VI: ILS Merge

Phase VII: CBT Training Tie-in

SYNOPSIS

- ASE Knowledge Based Website Project Is Now at the Start of Our Marketing Phase

- The Website Is Functional and the Data Base Architecture Has Been Established

- The Database Is Currently Populated With Limited Demonstration Data

- Our First Marketing Presentation Will Be for the Type Commanders for Buy-in on Concept

- Current Funds Will Be Expended on Integrating Additional Demo Data and "Buy-in" Meetings With Type Commanders

- Additional Funding Is Requested to Start the Sponsorship Marketing Phase

- DON E-commerce Group Is a Potential Sponsor and Is Currently Considering the ASE Knowledge Based Website Initiative

- TYCOM and PMA Support Is Critical to the Successful Implementation of This Venture

Web Enabled Access Portal
Objective

- Identify Inadequacies of Enterprise Data Access Systems
- Provide a Limited Demonstration Proof-of-Concept Solution That:
  - Provides Data Access to a Variety of Support Databases
  - Without Specialized Database Training
- With Single User Query, System Will Retrieve From Multiple Data Sources
- Effectively Updates the Maintainers Management Information System to Current Commercial Status

Integrated Database Access Portal

- Logistics Demands Require Access to a Variety of Databases
  - SERMIS   AMMRL   NATEC
  - FEDLOG   PARTSMASTER
  - AUTOSERD   VAMOSC
  - AMSR   NALDA
  - NAMP   NAVICP

- Data Sources Are Prevalent – Data Mining Is in Its Infancy

- Search Capability Across Sites a Key Element in Transforming a Data Infrastructure Into Information and Knowledge Management
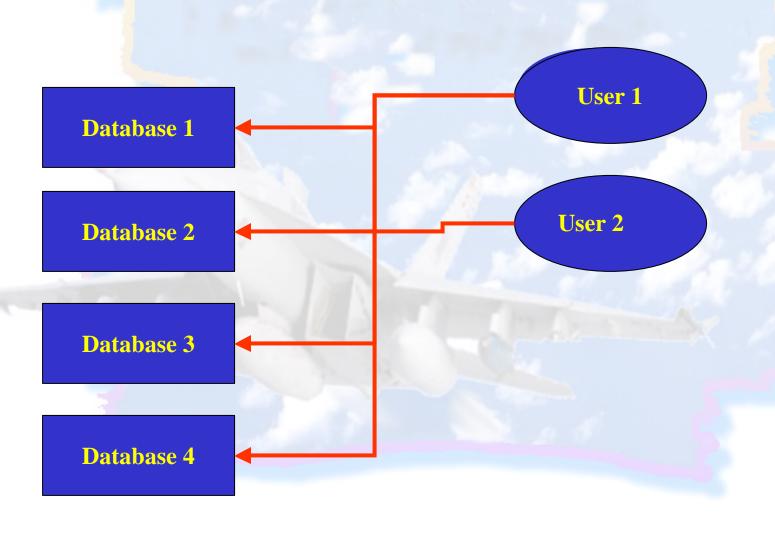
Approach

- Research and Document Current Military Maintenance Database Architectures to Determine Data Access and Retrieval Methods

- Research and Document Available COTS Database Connectivity Objects As Well As Custom Software Solutions for Use in the Prototype System

- Research and Define the Optimum Design Model for the Prototype System

- Develop System-level Models to Include: Fleet Application Interface and Middle Ware Application

- Select Two Existing Navy Databases for Proof-of-Concept Model Development

- Develop Common Access Portal and Integrate Database Model Connectivity Objects

- Develop a Detailed Targeted Proposal for a Prototype System Which Will Allow Access to Enterprise Data Through a Common Access Port
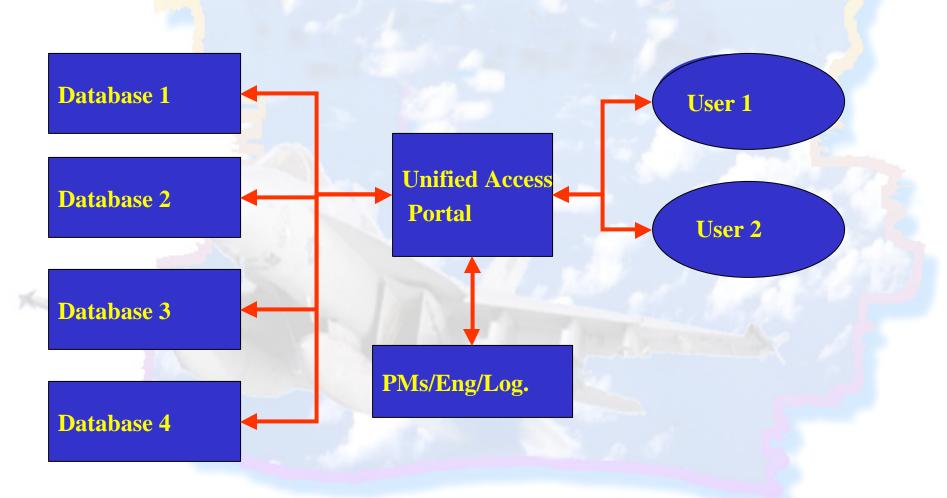
Existing Database Access

Synopsis

- The ASE Portal Is An S&T Initiative Awaiting Funding
- There Is Some Interest From The F/A-18 Program
- In The Infancy Stage As An Experiment With AIMD
- AIMDS Ashore And Afloat
- Depots
- ILS Community

Wearable Wireless Computer Tele-Maintenance Aid

- Multimedia Enhanced Tele-Maintenance
- On-The-Job Training and Learning
- Instant Access to Task Critical Information/Expertise
- Improved Productivity of Maintenance Department
- Real-Time Communications and Teamwork

The Well-Dressed Maintainer

Headset Display Microphone & Earpiece

Keyboard

Wearable Wireless Computer

Tablet Display & Writing Surface

System Basic Features

- **Maximize Hands-free Operation**
  - **All Components Secured**
  - **Voice-activated Computer**
  - **Eyepiece Visible But Not Intrusive**
- **Maximize Convenience**
  - **Data Entry By**
    - **Voice Command**
    - **Handwriting**
    - **Keyboard**
  - **Display Choice**
    - **Headset**
    - **Tablet**
- **Real-time Wireless Linkage To:**
  - **Remote Data/Drawings**
  - **Instructors**
  - **Mentors**
  - **Supervisors**
  - **Peers**

System Application

- **Maintainer Can Access:**
  - **Maintenance Guides And Instructions**
    - Written
    - Audio
    - Video
  - **Maintenance Data And Drawings**
    - On-line
    - Remote
  - **Maintenance Assistance**
    - Expert Systems
    - Application Notes/Videos
    - Instructors, Supervisors And Mentors

System Support

- COTS Hardware And Software

- Low Cost, About $7K For Entire System

- Unique Weapons Materials, E.G. Videos, Drawings And Data Can Be:
  - Stored On-line Or Off-line
  - Accessed Via Wired Or Wireless Links
  - Generated With COTS Software And Hardware Tools

Major Advantages

- Reduces Maintenance Personnel By:
  - Improving Efficiencies
  - Allowing Student-paced Training
  - Force-multiplier For Mentors
- Offers Real-time Logistics Data Feedback:
  - Failure Location
  - Failure Type
  - Part/Serial Number Tracking
  - Spares Requirements Predictions
  - Maintainer Activity/Performance
  - Maintenance Action Costs

Current Applications

- Xybernaut Mobile/wearable Computers Tested and Approved As Component of U.S. Navy RTASS Program Under SSIL Certification October 03, 2002 08:40:00 AM ET (MSN Business Wire)

- Fedex Has Acquired 190 Xybernaut MA V Systems
  - Evaluation Stage at 4 Locations
  - Wireless Access Between Maintainer and Fedex Intranet
  - Review of Tech Manuals for Aircraft Repair
  - Review Aircraft Wiring Diagrams
  - Research Parts Catalogs
  - Order Aircraft Parts
  - Sign Off Aircraft Discrepancy Reports
  - Print Orders, Diagrams, Etc. Remotely Using Wireless Connection

Proposed Approach

- Introduce as a Maintenance Self-Training Aid

- Work With the Fleet as Experiment

- Market to TYCOMs for "Buy-In"

- Demonstrate the Self-Training Capability to SYSCOMS & HQ

Synopsis

- WWC Tele-Maintenance Aid is a Network-Centric Solution
- Awaiting Funding
    - ONR S & T Initiative
    - LACTD
    - Local S & T Initiative
- Currently an Experiment with AIMD

Integrated Self Training